

REMARKS

I. General

Claims 1-25 are pending in the application. Claims 1-5 and 17-20 stand rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter. Claims 1-4, 6-15, 17-19, and 21-25 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,850,538 to Steinman (hereinafter "Steinman") in view of U.S. Patent Publication 2005/256890 to Rajasekaran et al. (hereinafter "Rajasekaran"). Claims 5, 16, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Steinman in view of Rajasekaran and further in view of U.S. Patent 6,901,207 to Watkins (hereinafter "Watkins").

II. Rejections Under 35 U.S.C. § 101

Claims 1-5 and 17-20 are rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

On pages 2-4, the Office Action rejects claims 15 and 17-28 under 35 U.S.C. § 101 for being directed to non-statutory subject matter. Applicant traverses the rejections by explaining below that the claims are, indeed, directed toward at least one class of patent-eligible subject matter.

35 U.S.C. § 101 recites:

Whoever invents or discovers any new and useful process,
machine, manufacture, or composition of matter, or any new and
useful improvement thereof, may obtain a patent therefor, subject
to the conditions and requirements of this title.

The Office Action rejects claims 1-5 and 17-20 under the rationale that the claims can cover an embodiment wherein the recited "computer readable medium" is a carrier wave or signal, and thus energy. Specifically, the Office Action asserts that such embodiments do not fall under any of the statutory categories of eligible subject matter (new and useful process, machine,

manufacture, or composition of matter, or any new and useful improvement thereof) because carrier waves and signals are “energy.” Such reasoning is incorrect because signals and carrier waves are tangible and, in fact, can be characterized as other than energy.

Merriam-Webster defines “tangible” as “1 a : capable of being perceived especially by the sense of touch : PALPABLE b : substantially real : MATERIAL.” Merriam-Webster Online Dictionary, found at <http://www.m-w.com/dictionary>, (2006) (last accessed August 15, 2006). Whether embodied as an electrical current or an electro-magnetic (EM) wave, signals and waves are tangible. For instance, when voltage is high enough, electricity can be felt by a person. Furthermore, electromagnetic waves are perceived by persons when visible light hits retinas, when microwaves cause a heat sensation on skin, etc. It should also be noted that electrons, which comprise current flow in an electrical signal, and photons, which are quantum particles of EM radiation, can be viewed as particles in addition to being viewed as energy. *See* attached passages from Larousse Dictionary of Science and Technology, describing electrons and photons. Larousse Dictionary of Science and Technology, Professor Peter M. B. Walker, ed., Larousse plc, 1995. Thus, the Office Action’s assertion that carrier waves and signals are “energy” is unsupportable to the point of defying physics and denying credit to human perception.

Moreover, the Office Action’s focus on energy is simply misplaced, as the Office Action proffers no support in the statutes or case law for energy under 35 U.S.C. § 101. Nor is there any requirement that an invention not cover subject matter in the realm of energy, waves, or signals. The proper focus is on whether the invention falls under one of the categories of eligible subject matter. A correct reading of claims 1-5 and 17-20 and of 35 U.S.C. § 101 would lead one to realize such claims are directed at least to a manufacture. That is, such claims are directed to “a data structure that is stored on computer-readable medium,” which is a manufacture no matter which computer readable medium is the focus of analysis. Since it is well settled that computer readable media statutory, Applicants do not present arguments therefore herein. In embodiments wherein the storage medium is a carrier wave or signal, the manufacture is a computer program

mechanism embedded in the flow of electrons and/or the motion of photons, both of which are shown above to be particles and tangible.

A man-made product of particles is a manufacture under any definition of the word. For instance, the Patent Office cites one reading of “manufacture” by the Supreme Court—“the production of articles for use from raw or prepared materials by giving these materials new forms, qualities, properties, or combinations, whether by hand labor machinery.” *See Diamond v. Chakrabarty*, 44 U.S. 303, 308, 206 U.S.P.Q. 193 (1980). *See also* “Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility,” Annex IV, OG Notice of 22 November 2005. A computer program mechanism embedded in the flow of electrons and/or the motion of photons is, in essence, the man-made production by emission of the flow/motion in patterns that convey information, the patterns being a new quality given to the materials. Thus, the various embodiments described by claims 1-5 and 17-20 are properly characterized as manufactures no matter the form of the computer readable medium.

As explained above, claims 1-5 and 17-20 of the present application are directed, at least, to a manufacture, which is a statutorily enacted class of eligible subject matter. The Office Action’s assertion that the claims are directed to “energy” is incorrect because even in embodiments wherein a computer readable medium is a wave or signal, such wave or signal is tangible and can be considered to be made of particles. Also, there is no requirement under the law that claimed subject matter must exclude all non-tangible or energy-related embodiments. Accordingly, withdrawal of the 35 U.S.C. § 101 rejection of claims 1-5 and 17-20 are respectfully requested.

III. Rejections Under 35 U.S.C. § 103

A. Claims 1-4, 6-15, 17-19, and 21-25 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Steinman in view of Rajasekaran.

To establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference

itself or in the knowledge generally available to one of ordinary skill in the art, to modify the applied reference. Second, there must be a reasonable expectation of success. Finally, the applied reference must teach or suggest all the claim limitations. See M.P.E.P. § 2143. Without conceding the first and second criteria, Applicants respectfully assert that the rejection does not satisfy the third criteria, as discussed further below.

The Office Action admits that Steinman does not teach having the sorted portion be searchable with $O(\log N)$ performance. The Office Action attempts to cure this deficiency by introducing Rajasekaran, which the Office Action alleges to teach having such a limitation. However, this combination, as presented, does not teach or suggest all limitations of the claimed invention.

Claim 1 defines a data structure that is stored on a computer-readable medium that includes a boundary that separates the sorted portion and the unsorted portion. Neither Steinman nor Rajasekaran teaches at least these limitations. The Office Action does not rely upon Rajasekaran at teaching this limitation and instead relies upon Steinman. More specifically, the Office Action cites column 6, line 65- column 7, line 9 of Steinman as teaching this limitation. However, Steinman does not teach this limitation. Steinman teaches using two separate queues, a Q queue and a Qtemp queue. This arrangement does not have a boundary located between the two separate queues. In fact, since the two queues are separate, they do not need a boundary between them. Thus, the combination of Steinman and Rajasekaran does not teach all of the claimed limitations. Claim 1 also requires that the sorted portion of the data structure be searchable with $O(\log N)$ performance while an entry is added to the unsorted portion. The Office Action states that Steinman does not teach these limitations, and relies upon Rajasekaran. However, Rajasekaran does not teach this limitation. Rajasekaran does not that the sorted portion of the data structure be searchable with $O(\log N)$ performance while an entry is added to the unsorted portion. Paragraph [0123] of Rajasekaran does state that a balanced binary tree can be searched in $O(\log Q)$ time, it does not state that the tree can be searched while an entry is added to the unsorted portion. Thus, the combination of Steinman and Rajasekaran does not

teach all of the claimed limitations. Therefore, the Applicants respectfully assert that for the above reasons claim 1 is patentable over the 35 U.S.C. § 103(a) rejection of record.

Claim 6 defines a method of using a container that includes adding an entry to the unsorted portion during the searching. Neither Steinman nor Rajasekaran teaches at least these limitations. The Office Action does not rely upon Rajasekaran at teaching this limitation and instead relies upon Steinman. More specifically, the Office Action cites column 6, line 65- column 7, line 9 of Steinman as teaching this limitation. However, Steinman does not teach this limitation. Steinman does not teach adding an entry during searching. The portion of Steinman cited is silent as to this limitation. Thus, the combination of Steinman and Rajasekaran does not teach all of the claimed limitations. Therefore, the Applicants respectfully assert that for the above reasons claim 6 is patentable over the 35 U.S.C. § 103(a) rejection of record.

Claim 17 defines a computer program product that includes code for searching the unsorted portion of the container if no match is found in the search of the sorted portion with $O(N)$ performance. Neither Steinman nor Rajasekaran teaches at least these limitations. The Office Action does not rely upon Rajasekaran at teaching this limitation and instead relies upon Steinman. More specifically, the Office Action cites column 9, lines 31-36 of Steinman as teaching this limitation. However, Steinman does not teach this limitation. Steinman does not teach code for searching the unsorted portion of the container if no match is found in the search of the sorted portion with $O(N)$ performance. The portion of Steinman discloses sorting and merge operations of the operations and is silent as to searching the temporary queue. Thus, the combination of Steinman and Rajasekaran does not teach all of the claimed limitations. Therefore, the Applicants respectfully assert that for the above reasons claim 17 is patentable over the 35 U.S.C. § 103(a) rejection of record.

Claim 21 defines a computer system for managing data objects that includes means for identifying a boundary within said memory means for storing, wherein data objects stored in a first portion of said memory means defined by said boundary are stored in an ordered manner

and data objects stored in a second portion of said memory storing means defined by said boundary are stored in an unordered manner.

Neither Steinman nor Rajasekaran teaches at least these limitations. The Office Action does not rely upon Rajasekaran at teaching this limitation and instead relies upon Steinman. More specifically, the Office Action cites column 6, line 65- column 7, line 4 of Steinman as teaching this limitation. However, Steinman does not teach this limitation. Steinman teaches using two separate queues, a Q queue and a Qtemp queue. This arrangement does not have a boundary located between the two separate queues. In fact, since the two queues are separate, they do not need a boundary between them. Thus, there can be no means in Steinman to identify a boundary. Consequently, the combination of Steinman and Rajasekaran does not teach all of the claimed limitations. Therefore, the Applicants respectfully assert that for the above reasons claim 21 is patentable over the 35 U.S.C. § 103(a) rejection of record.

Claims 2-4, 7-15, 18-19, and 22-25 depend from base claims 1, 6, 17, and 21, respectively, and thus inherit all limitations of their respective base claim. Each of claims 2-4, 7-15, 18-19, and 22-25 sets forth features and limitations not recited by the combination of Steinman and Rajasekaran. Thus, the Applicants respectfully assert that for the above reasons claims 2-4, 7-15, 18-19, and 22-25 are patentable over the 35 U.S.C. § 103(a) rejection of record.

B. Claims 5, 16, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Steinman in view of Rajasekaran and further in view of Watkins.

To establish a prima facie case of obviousness under 35 U.S.C. § 103(a), three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the applied reference. Second, there must be a reasonable expectation of success. Finally, the applied reference must teach or suggest all the claim limitations. See M.P.E.P. § 2143. Without conceding the first and second criteria, Applicants respectfully assert that the rejection does not satisfy the third criteria, as discussed further below.

Base claims 1, 6, and 17 are defined as described above. The combination of Steinman and Rajasekaran does not disclose these limitations, as discussed above. Watkins is not relied upon in the Office Action as disclosing these limitations. Therefore, the combination of Steinman, Rajasekaran, and Watkins does not teach all elements of the claimed invention.

Claims 5, 16, and 20 depend from base claims 1, 6, and 17, respectively, and thus inherit all limitations of their respective base claim. Each of claims 5, 16, and 20 sets forth features and limitations not recited by the combination of Steinman, Rajasekaran, and Watkins. Thus, the Applicants respectfully assert that for the above reasons claims 5, 16, and 20 are patentable over the 35 U.S.C. § 103(a) rejection of record.

IV. Conclusion

In view of the above, Applicants believe the pending application is in condition for allowance.

Applicants respectfully request that the Examiner call the below listed attorney if the Examiner believes that such a discussion would be helpful in resolving any remaining problems.

Applicants believe no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 08-2025, under Order No. 100203738-1, from which the undersigned is authorized to draw.

Dated: July 27, 2007

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being transmitted via the Office electronic filing system in accordance with § 1.6(a)(4).

Dated: July 27, 2007

Signed: 

Joy H. Perigo

Respectfully submitted,

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